

WHAT IS CLAIMED IS:

1. A video deinterlacing system for receiving interlaced video data at a non-deterministic rate and for generating non-interlaced data as a function of said interlaced video data, comprising:

a plurality of processing units for processing said interlaced video data, at least some of said processing units requiring clocking rates that differ from clocking rates required by other of said processing units; and

a timing generator responsive to a base clock and to a data valid signal, said data valid signal indicative of arrival of a portion of said interlaced video data, for causing generation of a plurality of enable signals, each of said enable signals enabling a corresponding one of said clocking rates required by said processing units.

2. A video deinterlacing system as set forth in claim 1 wherein said plurality of enable signals are generated as a set of sequentially occurring signals to cause said processing units to process said video data.

3. A video deinterlacing system as set forth in claim 1 wherein said plurality of processing units comprise a motion detector for detecting motion in individual frames of said video data, and wherein said video deinterlacing

system further comprises means for causing capture of a frame of said video as a function of the motion detected by said motion detector.

4. A video deinterlacing system as set forth in claim 1 wherein said
5 plurality of processing units comprise a cross-color suppressor for removing cross-coloring introduced in a chroma component of said non-interlaced video data due to overlap of luma spectral content.

5. A video deinterlacing system as set forth in claim 1 wherein said
10 plurality of processing units comprise a line doubler for performing line doubling as a function of motion-weighted spatial and temporal interpolation.

6. A video deinterlacing system as set forth in claim 5 wherein said
15 plurality of processing units comprise a compression filter for removing artifacts in said non-interlaced video data.

7. A video deinterlacing system as set forth in claim 1 wherein said
20 plurality of processing units comprise a video enhancement module for performing artifact removal and edge sharpening on said non-interlaced video data.

8. A video deinterlacing system as set forth in claim 1 wherein said plurality of processing units comprise a post-processing module for downsampling of said non-interlaced video data.

5 9. A video deinterlacing system as set forth in claim 1 wherein said data valid signal is generated by a source of said interlaced video data and wherein deactivation of said data valid signal by said source halts operation of said processing units.

10 10. A video deinterlacing system as set forth in claim 9 wherein said non-interlaced data generated by said video deinterlacing system is received by a data sink and wherein said data valid signal is further generated by said data sink and wherein deactivation of said data valid signal by said data sink halts operation of said processing units.

15 11. A video deinterlacing system as set forth in claim 1 further comprising:

a motion detector, responsive to said non-interlaced data for detecting, frame by frame, motion in images represented by said non-interlaced data;

20 a motion sum accumulator, responsive to said motion detector, for storing a motion value indicative of an amount of motion in a frame;

a status register, responsive to said motion sum accumulator, for storing said motion value; and

a frame capture module, responsive to a changeable motion threshold range, indicative of a desired range of motion in a frame, and to said motion value, for causing capture of said frames of video characterized by a motion value within said motion threshold range.

12. A video deinterlacing system as set forth in claim 1 further comprising:

10 a stall counter, responsive to stalling of said deinterlacing system, for generating a stall value, indicative of an amount of time elapsed during said stall.

13. A video deinterlacing system as set forth in claim 10 further comprising:

15 means for causing disabling of at least a first image enhancement function performed on said input frames of said non-interlaced data.

14. A video deinterlacing system as set forth in claim 1 wherein said non-interlaced data generated by said video deinterlacing system is received by a data sink and wherein said data valid signal is generated by said data sink and wherein deactivation of said data valid signal by said data sink halts operation of said processing units.

31

15. A video deinterlacing system as set forth in claim 1 wherein said received interlaced video data comprises a plurality of input fields and wherein said non-interlaced data comprises a plurality of corresponding output frames
5 and wherein parameters indicative of processing functions performed by said processing units are updated upon generation of each of said output frames.

16. A video deinterlacing system as set forth in claim 1 characterized by a predetermined number of processing states, wherein said processing states
10 are executed upon receipt of said data valid signal.

Sub 20 17. A video deinterlacing system as set forth in claim 1 wherein said non-interlaced video data is time-delayed from corresponding non-interlaced data by a field delay.

18. A video deinterlacing system as set forth in claim 17 wherein said non-interlaced video data is characterized by a pixel delay and a line delay from said interlaced video data.

19. Apparatus for generating de-interlaced video data in response to non-deterministically received interlaced video data, comprising:

33
B5520-2T2T50

a processing pipeline, responsive to said interlaced video data, for
generating frames of said de-interlaced video data in response to said received
interlaced video data, said processing pipeline performing a plurality of
processing functions characterized by different clocking rates, each of said
5 clocking rates related to a base rate; and

a timing control unit responsive to arrival of said interlaced video data for
generating a plurality multi-rate control signals to enable said different clocking
rates.

10 20. Apparatus as set forth in claim 19 characterized by an effective
frame rate corresponding to an effective frame of a source of said non-
deterministically received interlaced video data.

15 ~~21.~~ A video frame capture system comprising:
a motion detector, responsive to input frames of video data for detecting,
frame by frame, motion in images represented by said video data;
a motion sum accumulator, responsive to said motion detector, for storing
a motion value indicative of an amount of motion in a frame;
a status register, responsive to said motion sum accumulator, for storing
20 said motion value; and
means, jointly responsive to a changeable motion threshold range,
indicative of a desired range of motion in a frame, and to said motion value, for

causing capture of said frames of video characterized by a motion value within
said motion threshold range.

Sub a3 > 22. A video frame capture system as set forth in claim 21 further
5 comprising, means for causing disabling of at least a first image enhancement
function performed on said input frames of video data.

A22a4 >

0342711-072998